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Note on Salix Sitchensis and its affinities.—Among some specimens of willows sent from Washington Territory, by Mr. W. N. Suksdorf, my attention was particularly directed to one showing but a single stamen under each scale. There were fertile aments to match, and good leaves accompanying both sexes, so that I had no hesitancy in referring all to *Salix Sitchensis*, the fruit of which is quite unique among American willows. Need I say that no time was lost in a critical re-examination of all the staminate *Sitchensis* in my herbarium, from British Columbia to California, nor how astonished I was to find this peculiarity of a single stamen, constant throughout! At first glance the profusion of stamens in Mr. Howell's specimens appeared to belie any such reduction, but it needed only the most cursory examination with a magnifier to show what an oversight I had been guilty of, at the very outset, in framing my key to the *Diandræ* of the Californian Flora. This brings me directly to remark that we have now a clew to the true character and affinity of that obscure species, *S. Coulteri*. It is, in my opinion, simply an extravagant, autumnal growth of *Sitchensis*, bearing the same relation to the normal development of the species that the serotinous state of the *S. lasiolepis* (upon which *S. Hartwegi* was founded) does to typical *lasiolepis*. Considering the excessive variability of the leaves of willows there is nothing in the form, vesture, petioles or stipules to invalidate this view, while on the other hand we have the significant fact that *Sitchensis* and *Coulteri* share together the single stamen—a character unique among Pacific coast willows.

Salix Coulteri is known only from two gatherings, the original one by Coulter, and the other by Bolander, both staminate, with scarcely developed aments appearing in the axils of leaves so old, so thoroughly mature and rigid, that where doubled in pressing they have *broken* instead of bending. Above there is a younger growth, such as might appear along with the normal expansion of the aments. Bolander says the tree is "common in Marion county," but if this is true why has the pistillate plant never been collected? If however we find that *Coulteri* is only an abnormal, secondary growth of what under ordinary conditions would be recognized as *Sitchensis*, the answer is obvious. Old leaves of *Sitchensis*, known to be such, I have never seen. I doubt if they exist in any herba-

rium on either side of the Atlantic. At best we have had young, succulent growths—usually taken with the mature fruit. Mr. Suksdorf's specimens give us the full grown—if not the old and rigid leaves, and they show a decided approach to so called *Coulteri*! It remains to consider the thicker and more densely villous aments, and the stout, furrowed, tomentose twigs of *Coulteri*; but here again Mr. Suksdorf's specimens are intermediate in character, and we need only concede a degree of variation paralleled by our famliar *S. humilis* to warrant the uniting of the two extremes.

I broach, with much hesitancy, a further consideration of the place of *S. Sitchensis* in a methodical arrangement of species. Professor Andersson grouped it with *sericea* and *petiolaris* as a peculiarly American type, at the same time arranging *Coulteri* with *lasiolepis* as manifestly representing the European *S. daphnoides*, suggesting however a doubtful affinity to *S. discolor* (*eriocephala*) and *S. lanata* through the intermediation of *Hookeriana* and *speciosa*. Remembering the scanty material before the distinguished Salicologist these conjectures appear sufficiently plausible; but *Coulteri*, must be most nearly allied to—if not identical with—*Sitchensis* and it is clear that *Sitchensis* is distinguished from the species with which it has been heretofore associated not only by the single stamen but also by the long, narrowly cylindrical fertile aments erect then spreading, subsessile capsules with manifest style—short petioled leaves with entire revolute margins, etc.

May it not be that *Sitchensis* represents in America the European *Synandræ*; a group so commonly distributed throughout Europe and Asia that its entire omission from our flora has always appeared remarkable, and furthermore one which if found at all with us would most likely appear on the Pacific slope where already *S. Breweri* gives us our only species of the *Viminales*. Is the coalescence of the two stamens in *purpurea* carried a step further to the extreme of suppressing entirely one of the members in *Sitchensis*?

A peculiar American type it may still be, "*pulcherrima et distinctissima species*" it most certainly is, but its place seems to be with or near the *Synandræ* rather than among any of the recognized groups of the *Diandræ*.—M. S. Bebb.

Protandry of Pastinaca.—Will you kindly allow me to correct a mistake into which your correspondent, A. F. Foerste, falls, in his note on "Pastinaca sativa Proterandrous" (Bot. Gazette, Feb. 1882, p. 24.). So far as I know all *Umbelliferæ* that have been studied in this respect are described as protandrous, and in nearly every case the dichogamy is quite as marked as in *Pastinaca*. Although not understood, the fact was observed by Pontedera 160 years ago; and it was well described and explained by Sprengel near the end of the last century. There are probably a few genera having inconspicuous flowers, with imperfect protandry, and it is not impossible that synacmic species may be found. So

far as I recollect, however, no case of this sort is known in the order; and the only instance I recall in which the dichogamy is incomplete enough to allow self-fertilization is afforded by the genus *Hydrocotyle*, described by Herman Muller (Weitere Beobachtungen, 1879, I. p. 32-33.). Even here there is very pronounced protandry, for the stigmas do not become receptive until the last stamen has matured; and the accelerated development of the pistil is doubtless correlated with the reduced flowers and umbels of this aberrant genus, and the attendant decrease in the number of its insect visitors. The causes which led to this reduction in the attractiveness of the flowers are probably of an entirely different nature, and connected with the changed habit of the plants. In Germany the flowers of the parsnip are said by Dr. Muller to be visited by Hymenoptera and Diptera, never by Coleoptera!—WM. TRELEASE, *Cambridge, Mass.*

Seeds of Orontium and Symplocarpus.—Has any Botanist of U. S. got ripe seeds of *Orontium* and of *Symplocarpus*, and will they forward some by mail to Sir J. D. Hooker, Royal Gardens, Kew, London? No matter how old; they are wanted for the *structure*.—A. G.

The Greenland Flora.—A year hence the classical *Flora Danica* will be terminated by the completion of the seventeenth volume. The work will contain figures of 4,000 species of plants, of Scandinavia, including Greenland and Iceland. It has been published wholly at the expense of the King of Denmark, and a right royal work indeed. At its completion the plates (in folio) which relate to Greenland plants, and which illustrate its whole flora, are to be separately issued, with a brief letter press, under the title of *Icones Floræ Groenlandicæ*. As this flora is in one sense American, and as the copies of the whole Flora Danica in the United States are and must be very few, we take pleasure in announcing this illustrated Greenland Flora to American botanists. Some of them will wish to possess it. The price of uncolored copies is fixed at 56 francs, of the colored at 236 francs. It should be added that, as the impression is strictly limited, application should be made very promptly. The editor, Professor Joh. Lange, Copenhagen, informs us that he will himself receive subscriptions, up to the first of May next.—A. G.

A Note from Emesby.—EDITOR OF THE BOTANICAL GAZETTE.—Let me thank Professor Rothrock most heartily for his courteous statement—or rather re-statement—of the methods and "trend" of botany teaching in the University of Pennsylvania; after which I ought not to have another word to say further than to disclaim all thought or intention of "criticising" the articles which appear-

ed in the GAZETTE from the pen of this genial writer; articles which no one could have read with more cordial appreciation than I. The truth is, I was away from home, and dropping into a public reading room to spend a leisure hour, I picked up a periodical which, for all the botany it contains, I have not considered worth subscribing for, and the whole spirit of the little I did read on this occasion prompted my hasty and inconsiderate protest. Had I waited for the next number of the GAZETTE, giving Prof. Beal's methods and the editorial comments theron I would have felt reassured and remained in becoming obscurity.

I wrote in the interest of the "average amateur"—being of that "small fry" myself. I had no right—indeed am utterly incompetent—to write in the interest of the average Professor seeking to advance the cause of Science and at the same time his individual reputation "in the direction of least resistance" by working in fields that have only been left unexplored because they are comparatively uninviting.

But I must have said something very naughty to stir up the Botanical editor of the *Naturalist* to a notice covering just nine lines, but so crowded with apparently unconscious perversions, misquotations, and unwarranted inferences that I stand amazed! I am charged with placing too high a value on the "identification of a *few plants* (when I distinctly urged the very reverse) or the "finding of a new species"—when I never said a word about new species, and in point of fact consider "new species" a chance game, the "finding" of which may just as well fall to the lot of a fool as a philosopher. The eliminating of Mr. Watson's species to which I incidentally referred, directly resulting from a thorough revision of the genera to which they respectively belong, is quite another matter.

What I did say is this: that a large proportion "of amateurs are interested" in plants themselves, in their structural affinities as expressed in a methodical arrangement "which involves organography—comparative morphology—and systematic botany" and "in their geographical distribution and antecedents." Under this last head may I quote from an address given by Charles Kingsley to the Scientific Society of Winchester. He says: "I ask you to consider for a time, a subject which is growing more and more important and interesting, a subject the study of which will do much toward raising the field naturalist from a mere collector of specimens—as he was twenty years ago—to a philosopher elucidating some of the grandest problems. I mean the infant science which treats of the distribution of plants and animals over the globe and the causes of that distribution." "It begins with asking every plant or animal you meet, large or small, not merely what is your name? That is the collector and classifier's duty, and a most necessary duty it is, and one to be performed with the most conscientious patience and accuracy so that a sound foundation may be built for future specu-

lations. But * * how did you get here? By what road did you come? What was your last place of abode?" And better still, Wallace in "Island Life," p. 6: "If we take the organic productions of * * * any very limited tract of country, such as a moderate country parish, we have, in their relations and affinities—in the fact that they are *there* and others are *not* there, a problem which involves all the migrations of these species and their ancestral forms—all the vicissitudes of climate and all the changes of sea and land which have affected those migrations—the whole series of actions and reactions which have determined the preservation of some forms and the extinction of others—in fact, the whole history of the earth, organic and inorganic, throughout a large portion of time." And further on he says: "We require then in the first place an adequate knowledge of the fauna and flora of the whole world and even a detailed knowledge of many parts of it." * * "This kind of knowledge is of very slow growth and is still very imperfect. In the next place we require a true and natural classification of animals and plants so that we may know their real affinities and it is only now that this is being generally arrived at." Here certainly, is "ample room and verge enough" for the exercise of all the mental power the "average amateur" is possessed of—not to include the average Professor as well.

I distinctly disclaimed any intention to disparage histological studies, but nevertheless would protest against the thrusting of histology upon students as a first step in the acquisition of a knowledge of systematic botany. Need I do more in this connection, now, than to remind the reader of the programme of a summer school, not long since, and place beside it this quotation from the preface to the last edition of Gray's Text Book: "Structural and Morphological Botany of Phaenogamous Plants properly *comes first*. It should thoroughly equip a botanist for the scientific prosecution of Systematic Botany, and furnish needful preparation to *those who proceed* to the study of Vegetable Physiology and Anatomy!"

But I don't "understand plants as living things." That depends! I strive to the extent of my ability to study my fellow-men as "living things;" but I much prefer to go to the Herbert Spencer's Sociology for instruction to dissecting a cadaver under the best demonstrator of human anatomy in the country. It is a question of predilection as I said before—and I for one do not propose to quietly submit to the claims of the anatomists that they are the only students of "living things."

Is the little tufted, alpine *Diapensia* which we find on the summit of Mount Washington, with all the fascinating associations which cluster around it as a relic of the glacial period, more or less a living thing than a pickled pumpkin vine?

As to the advantage of the study of botany on account of the

comprehensiveness and perfection of its classifications let me offer the following from Prof. Youmans: "No other subjects compare with zoology and botany in these respects. Not only do they furnish inexhaustible material for the exercise of memory, but by the presentation of facts in their natural relations, they exercise it in its highest and most perfect form." * * "They open to us the broadest view of the relations and harmonies of organic nature, and are best fitted to discipline the mind in dealing with large co-ordinations, and the comprehensive arrangement of objects of thought, whether in the arts, the professions, business or science."

I have quoted freely the words of eminent men, hoping thereby to encourage young botanists to hold bravely to their preferences, who might have treated any argument advanced by myself as not worthy of consideration.—EMESBY.

American Grape Mildew in Europe.—The fact that our common grape mildew, *Peronospora viticola* B. & C. grows luxuriantly on cultivated varieties of *Vitis vinifera* in this country was noticed in the Bulletin of the Bussey Institution of March, 1876, and although owing to the dryness and short duration of our summers it was there stated that no great harm need be anticipated to the grape crop in the northeastern States, it was suggested that the case might be very different should the fungus be introduced into the vineyards of Central and Southern Europe, where the climatic conditions are very different from ours. In 1877 Dr. Cornu called attention, in the Comptes Rendus, to the danger of the introduction of the *Peronospora* into France by the importation of American vines; and, as is well known, his fears were soon realized. In 1878 the mildew was detected by Planchon in the southwest of France, and in the following year by Therry in the vicinity of Lyons, by Pirotta in Northern Italy, and in Switzerland. Since then the spread of the disease has been rapid and it has attacked the vineyards in the greater part of France and Italy and has extended as far eastward as Hungary and as far southward as Algiers.

As was natural, great alarm was excited by the appearance of the fungus in wine growing districts, and the agricultural journals of France and Italy especially have contained numerous articles on the disastrous effect of the mildew and the means of prevention. With reference to the injurious effect on the wine crop opinions vary considerably; some maintaining that the *Peronospora* is even more harmful to the vine than the *Phylloxera*, while others declare that the injury done is not great. Official investigations have been undertaken in Italy and France for the purpose of ascertaining the best way of combatting the disease.

The latest contribution on the subject is the Report of Prof. Prillieux in the Journal Officiel, Jan. 9th, 1882, who was appointed to study the mildew and its development in the vineyards of France

and Algiers. After giving an account of the morbid appearances produced in the vines and a sketch of the development of the *Peronospora* and its mode of propagation, he states that the evil effects of the *Peronospora* are much greater in Algiers than in France. In the former country the fungus makes its appearance in May, causes the leaves to wither, and exposes the young grapes to the burning sun. The activity of the disease disappears in July. In the region of Bordeaux the mildew also appears early in the season and sometimes with such virulence that the conidial tufts appear not only on the leaves and young stems but also on the flowers and young berries, on which parts, as far as I know, the fungus has never been observed in this country. Prof. Prillieux, however, does not think that the harm done by the *Peronospora* is very great to the wine crop, for the danger is not so much from injury to the grapes as from injury to the nutrition of the vines by the premature fall of the leaves. Admitting that in exceptionally moist years serious trouble might arise, he thinks that in ordinary years the dry weather of midsummer would prevent marked injury from the growth of the *Peronospora*.

The use of lime having been proposed by Prof. Garovaglio, of Pavia, as a remedy, M. Prillieux experimented with powdered lime sprinkled on the leaves, but he found no beneficial effects. Even when the spots on the leaves where the *Peronospora* appeared were cauterized new conidial tufts appeared on the margin of the spots. Experiments with antiseptic fluids sprinkled on the leaves were without satisfactory results. As a practical measure it is advised to burn the leaves affected, because the oospores contained in them carry the disease over to the next season. Oospores have been found by Millardet and Prillieux in grape leaves in France, and the latter thinks that they occur abundantly. It is not improbable that they are abundant in this country, but owing to the density and hairiness of the leaves of most of the varieties of grape cultivated in this country it is almost impossible to detect their presence with the naked eye or a hand lens, and, as far as my own experience goes, examinations with the compound microscope show oospores only in a comparatively small number of leaves. A continued observation of the disease as it occurs in New England has failed to convince me that any perceptible injury is done to the vines in that region where the short and unusually dry summers are unfavorable to the full development of the *Peronospora*. Dr. Engelmann, however, states that the fungus produces injury in some of the Western States. In Algiers, where the conditions are very different from those of New England and favor the appearance of the fungus early in the season, the disease, as might be expected, is most disastrous.—W. G. Farlow.

Chrysogonum Virginianum, var. **dentatum.**—I wish to direct the attention of botanists in the lower Middle and Southern States

to a striking variety of our *Chrysogonum*, which grows apparently intermixed with the ordinary form. The low and subcaulescent forms of the two appear to be nearly alike. But in the well developed and taller forms, rising to a foot in height, the difference is that this var. *dentatum* has the leaves strongly serrate (instead of crenate), all the upper ovate and acute, the base not cordate, the teeth callous-mucronate, and a very pronounced callous mucro makes a conspicuous point to the involucral bracts. It is found on High Island in the Potomac, Maryland, and was first received from Mr. J. Donnell Smith, who collected it in June, 1881. Specimens from the same locality collected in May and June, 1879 and 1880, by Mr. L. F. Ward and Dr. Vasey, communicated by them, exhibit these characteristics in a less degree, and show that we have to do with only a marked variety.—A. GRAY.

Some New Grasses.—POA PULCHELLA.—Culms cespitose, decumbent at the base, from a much branched rhizome, the base crowded with the short almost filiform leaves which are seldom more than 1 inch long, with somewhat broadened and thickened bases; culms slender, smooth, erect, 4 to 6 inches high, with 1 to 2 short leaves, the blade ½ inch long or less, ligule 1 line long, membranaceous, obtuse; panicle 1 to 1½ inches long, 1 inch wide, erect, the lower branches in pairs, spreading, smooth, capillary, each with a single spikelet; spikelets purplish, 3 to 4 lines long, large for the size of the plant, 3 to 5 flowered; lower glumes about 1 line long, 3 nerved, smooth, mostly obtuse or somewhat erosely dentate, broadly scarious margined; flowering glumes about 2 lines long, 3 nerved, lanceolate, the upper ones a little acutish, the lower obtuse with scarious apex, finely scabrous on the keel and nerves, but not pubescent nor webbed at the base; lower palet about equaling the fl. glume strongly bidentate, and scabrous on the conspicuous nerves.

A handsome dwarf *Poa*, related to *P. laxa* but distinct, found by Mr. W. N. Suksdorf, on the Columbia river, from near the river bank to the summit of the hills (2,000 ft.).

POA BOLANDERI.—Culms 1 to 1½ ft. high, erect or somewhat geniculate below, with 3-4 conspicuous rather short and broad leaves (2 to 3 inches by 2 lines); sheaths striate, smooth, loose, ligule membanaceous, obtuse; panicle 4 to 6 inches long, the rays 1½ to 2 in., distant, mostly in pairs, frequently with 2 to 3 additional short ones, at first erect and appressed, becoming horizontal or reflexed, the longer ones 2-3 inches long, slender, mostly flowering near the extremities, the branchlets appressed and short pedicelled; rachis and rays smooth, spikelets 1 to 3 flowered, often only 1 flowered; outer glumes thin, green, scarious margined, the upper about 1 line long, lance-oblong, 3 nerved, frequently lacerate at the apex, the lower about one-third shorter and acuter; flowering glumes 1½ lines long, rather faintly 5 nerved, lanceolate, acute

(sometimes strongly so), smooth or minutely scabrous with a thin webby tuft at the base; palet ¼ shorter than its glume, narrow, smooth.

This is No. 6115 of Bolander's distribution, and recently collected by Prof. M. E. Jones, at Soda Springs, Cal. It is closely related to *Poa arctica*, which was also collected at the same place by Mr. Jones.

STIPA PARISHII.—Culms 1 to 1½ ft. high, leafy especially below; leaves conduplicate or involute, smooth, rigid and divergent, lower ones 6 inches, upper ones about 3 inches long, throat of sheath fringed with a few soft white hairs, ligule very short, upper sheath long, somewhat inflated and enclosing the base of the panicle; panicle about 6 inches long, open and somewhat spreading except at the included base, lower branches in threes, upper in pairs or single, rather few flowered at the ends of the branches and branchlets, longest rays about 2 inches; outer glumes linear-lanceolate, acute, 3 nerved, smooth, the lower one 6 to 7 lines long, the upper 5 to 6 lines, nearly twice as long as the flowering glume, which with the short stipe is 3 to 4 lines long, densely clothed with silky hairs which are longer toward the apex, bidentate, the teeth less than a line long; awn 9 lines long, smooth below, scabrous above.

Collected in the San Bernardino Mts., by Mr. S. B. Parish, for whom it is named.—G. VASEY.

Notes on California Plants.—*Balsamorhiza sagittata*, Nutt. grows on the west side of the Sierras at Summit, along with *Wyethia mollis*.

Dr. Gray did well to take it for granted (without proof) that *Collomia tinctoria*, Kellogg, was a var. of *C. linearis*. I have a form intermediate between the two, showing that they are not distinct as suggested in the Flora of California.

The flowers of *Eriogonum Lobbii* are sometimes ochroleucous, as well as white.

Polygonum Muhlenbergii grows at Santa Cruz.

The leaves of *Spiranthes Romanzoffiana* are net-veined.

Allium platycaule has linear-oblong reticulations. They are not absent.

The heads of *Hieracium albiflorum* are often slightly glandular in my Santa Cruz specimens, and in my Soda Springs specimens they are quite glandular even to the peduncles. The pubescence of the heads, in at least some species of Hieracium and *Crepis*, is a very shaky character.

It is a mistake to say that the leaves of the *Eucalyptus* of California "turn edgewise to the sun" and so give little shade. The young leaves are *pendent* and so vertical of course, but they do not show a sensitiveness by which the petiole is twisted to keep them

edgewise to the sun. The older leaves, however, are nôt even pendent and hold no particular position to the sun, and the trees give a great deal of shade though not as much as the broader leaved deciduous trees that have also a dense foliage.

Helianthemum scoparium is an almost shrubby perennial.

Arabis platysperma, in robust specimens has *auricled* leaves: the pubescence is more branched than "stellate."

Arenaria Douglasii has concentrically striate seeds, and they are often hairy at the hilum.

Hosackia subpinnata undoubtedly shows a transition to *H. Purshiana*.

I have what I suppose must pass for *Oxytheca dendroidea*, from Nevada. My specimens have all but the lowest bracts in twos; leaves hirsute, linear-oblanceolate; awns 1½ to 3 times the length of the involucre; flowers hirsute; pedicel and involucre glabrous, all the rest of the plant with stalked glands and some stellate hairs.

Menyanthes trifoliata grows in patches acres in extent in the Sierras and at Park City, Utah.

Juniperus occidentalis. I found a peculiar form of this with seed protruding from the berry like an acorn in the cup. Dr. Engelmann informs me that this sometimes occurs. I had never seen it in any *Juniperus* before. The leaves also have a large pellucid spot in the center.

The corolla of *Trifolium barbigerum* is very beautiful under a microscope magnifying about 30 diameters; it is covered with a white or purple net-work with circular meshes. The same is true of *T. cyathiferum* though in a less marked degree.

The seeds of *Hosackia strigosa* appears to the eye to be almost square with a notch on one side. They are, at least in my numerous specimens, a sure index to the species.

Hosackia maritima is often perfectly smooth, leaflets 6-7, stems 2° long, prostrate.

Hosackia Torreyi has the standard beautifully veined with purple.

Trifolium microcephalum has the lobes of the involucre often two-toothed.

My specimens of *Trifolium microdon* are very smooth except the pedicels.

Cornus Californica has very interesting branched hairs. The pubescence of *Platanus racemosa* called "tomentum" in *Bot. Cal.* is made up of very long hairs, branched in whorls or singly and jointed, densely matted, with straight, simple, rather flat hairs on the very young stems. The pubescence is more beautiful than that of *Alternanthera lanuginosa*.

I have *Hosackia oblongifolia* from Santa Cruz, which verifies Mr. Coulter's locality, upon which doubt is thrown in Bot. Cal.

Dr. Engelmann's note on *Eschscholtzia Californica*, in the GAZETTE, reminds me of the broad patches of this plant growing at Santa Cruz on chalky hills. I have seen a mat three feet in diameter growing from one thick root, with plenty of remains of former flowering stems still attached to the plant, showing that it is a perennial as Dr. E. suggests. It is strikingly different from the annual form in Southern Utah, but I doubt its claim to distinctness because of being a perennial.

The base of the petiole of leaves of *Ivesia Kingii* are strikingly hairy, but the hairs are concealed by the decaying remains of the outer leaves. The pubescence is as remarkable as that of *Lygodesmia spinosa*.—MARCUS E. JONES, *Salt Lake City*.

Notes from a Laboratory.—It is not unwelcome to teachers who have little spare time to know just what plant to give to a student of Vegetable Histology with the certainty that the particular tissue under consideration will be found in such form as to render it desirable for examination. With the object, therefore, of recommending a few common green-house plants, in which illustrative examples of the prominent tissues can be found, the following notes, from the work of the Sophomore class of Purdue University, are presented. Most of this work passed under my personal observation.

Of course every one will (if he be not too forgetful) have a good stock of pumpkin or squash stem to illustrate the dicotyledonous stem, and next spring all of us, by Dr. Bessey's recommendation, will lay in a supply of asparagus for the monocotyledonous one. Other plants are frequently wanted however, and the following to be had from almost any green house or window-garden, will be found useful:

Geranium (sp?)* exhibits an abundance of fine compound crystals in a transverse section of the leaf and a few in petiole and stem. Its starch grains are large and abundant (the plant was just well started from a slip) and the layers of cork-cells are numerous and regular.

Ageratum Mexicanum (Blue Ageratum). Collenchyma well shown.

Primula Sinensis (Primrose) has particularly fine trichomes. The presence of chlorophyll bodies in the epidermis is also a marked feature.

Nerium roseum (Oleander) is peculiar on account of the arrangement of the stomata in groups at the bottom of hairy pits in the under surface of the leaf.

*The specific names, when any are given, cannot be vouched for. They are as given me by our florist. All of the plants can be identified either by the common or generic names.

Cuphea platycentra (Cigar or Match Plant) shows splendid glandular trichomes.

Coleus harlequin shows collenchyma nicely.

Tradescantia, sp? (Wandering Jew) has remarkably regular epidermis on the upper surface of the leaves. In horizontal section it appears made up of almost exactly hexagonal cells. Very long slender trichomes at the nodes.

Pilea pilosa (Artillery plant) was one of the most interesting plants examined. The motion of the protoplasm carrying chlorophyll grains can be easily seen in the parenchyma of the primary cortex. Cystoliths, as in its wild congener, *P. pumila* are of extraordinary size and number, thirteen being counted in a cross-section of a small branch. They are everywhere, leaves and stems being full of them! The epidermal cells of the leaves are also extremely large.

Begonia semperflorens will compare favorably with the pumpkin for a "general purpose" plant. The epidermis is composed of large cells; the collenchyma is beautifully regular; the tracheary tissue is represented by spiral, angular, annular, scalariform and pitted vessels, many of the latter exhibiting the "crossed" pits; the lenticils show a peculiar development of cork; the starch grains are large and both simple and compound crystals are present (Vide BOT. GAZ. VII, 12). Finally the stomata occur in groups of 6–14 and show plainly the successive segmentation of the original epidermal cells to form the mother-cell of the stoma.

There is but one objection to the Begonia for general laboratory use and that can be easily overcome. It must be grown especially for the purpose, while any corn-field almost will furnish the standard pumpkin. The ease and rapidity with which it can be grown from cuttings will almost invalidate this objection, and this species seems to be more compact and easily handled than any other. The Begonia has several points of superiority over the *Cucurbitaceæ*, chiefly in the structure of the fibro-vascular bundle, which is much simpler and easier of comprehension by the average student. Trichomes (except on the root) are absent from this species. This plant in connection with those already in wide use, will be found of very considerable value in laboratory work.—CHAS. R. BARNES, *LaFayette, Ind.*

A Large Red-bud.—I found growing on the hill-side near my house a specimen of the Red-bud, *Cercis Canadensis*, which was about 14 inches in diameter at a point 10 inches above the ground. The trunk was well-formed throughout and free from from swellings or knots.—O. M. MEYNCKE, *Brookville, Ind.*